

WHAT IS CLAIMED IS:

1. A light falloff determining system comprising:
a polar transformer that converts an image into radial traces; and
a falloff fitter that fits said radial traces to a model of falloff to determine a light falloff amount for said image.
2. The system in claim 1, further comprising a discontinuity remover that removes discontinuities from said radial traces, thereby producing adjusted radial traces, wherein said falloff fitter fits said adjusted radial traces to said model of falloff to determine said light falloff correction for said image.
3. The system in claim 2, wherein said discontinuity remover comprises:
a differentiator that determines an estimate of derivatives of said radial traces;
a derivative adjuster that adjusts said derivatives and produces adjusted derivatives that are within minimum and maximum derivative bounds; and
an integrator that produces said adjusted radial traces from said adjusted derivatives.
4. The system in claim 1, further comprising a underexposure checker that prevents underexposed images from being processed by said polar transformer.
5. The system in claim 1, further comprising a falloff mask generator that generates a correction mask for said image based on said light falloff correction.

6. The system in claim 1, further comprising a grouper that combines fit values used by said falloff fitter to fit said radial traces to said model.

7. The system in claim 6, further comprising a weighting unit that weights said fit values.

8. The system in claim 1, further comprising a flash fire detector that determines whether said image was obtained with a flash depending upon said light falloff amount.

9. The system in claim 1, wherein said polar transformer produces said radial traces from a group of images and said falloff fitter determines a single light falloff amount for said group of images.

10. An image processing system comprising:
an image collector; and
a light falloff correction system comprising a polar transformer that converts an image into radial traces; and a falloff fitter that fits said radial traces to a model of falloff to determine a light falloff correction for said image.

11. The system in claim 10, further comprising a discontinuity remover that removes discontinuities from said radial traces, thereby producing adjusted radial traces, wherein said falloff fitter fits said adjusted radial traces to said model of falloff to determine said light falloff correction for said image.

12. The system in claim 11, wherein said discontinuity remover comprises:

a differentiator that determines an estimate of derivatives of said radial traces;

a derivative adjuster that adjusts said derivatives and produces adjusted derivatives that are within minimum and maximum derivative bounds; and

an integrator that produces said adjusted radial traces from said adjusted derivatives.

13. The system in claim 10, further comprising a underexposure checker that prevents underexposed images from being processed by said polar transformer.

14. The system in claim 10, further comprising a falloff mask generator that generates a correction mask for said image based on said light falloff correction.

15. The system in claim 10, further comprising a grouper that combines fit values used by said falloff fitter to fit said radial traces to said model.

16. The system in claim 15, further comprising a weighting unit that weights said fit values.

17. The system in claim 10, further comprising a flash fire detector that determines whether said image was obtained with a flash depending upon said light falloff correction.

18. The system in claim 10, wherein said polar transformer produces said radial traces from a group of images and said falloff fitter determines a single light falloff correction for said group of images.

19. A method of performing light falloff correction of an image, said method comprising:

converting an image into radial traces; and

fitting said radial traces to a model of falloff to determine said light falloff correction for said image.

20. The method in claim 19, further comprising removing discontinuities from said radial traces, thereby producing adjusted radial traces, wherein said fitting comprises fitting said adjusted radial traces to said model of falloff to determine said light falloff correction for said image.

21. The method in claim 20, wherein said removing comprises:
estimating derivatives of said radial traces;
adjusting said derivatives to produce adjusted derivatives that are within minimum and maximum derivative bounds; and
integrating said adjusted derivatives to produce said adjusted radial traces.

22. The method in claim 19, further comprising preventing underexposed images from being converted.

23. The method in claim 19, further comprising generating a correction mask for said image based on said light falloff correction.

24. The method in claim 19, further comprising combining fit values to fit said radial traces to said model.

25. The method in claim 24, further comprising weighting said fit values.

26. The method as is claim 19, further comprising applying said light falloff correction to said image.

27. The method as in claim 19, further comprising detecting a flash fire condition of said image based on an amount of said light falloff correction.

28. The method in claim 19, wherein said converting is performed on a group of images and said determining produces a single light falloff correction for said group of images.

29. A method of estimating an amount of light falloff in a digital image comprising:

providing a digital image;

providing at least one model of light falloff; and

fitting said model of light falloff to said digital image to determine said amount of light falloff in said digital image.

30. The method in claim 29, further comprising, before said fitting of said model, processing said digital image in order to remove large edges.

31. The method in claim 29, wherein said fitting comprises:

converting said digital image into radial traces; and

fitting said radial traces to said model of light falloff to determine said amount of light falloff in said digital image.

32. The method in claim 31, further comprising removing discontinuities from said radial traces, thereby producing adjusted radial traces, wherein said fitting comprises fitting said adjusted radial traces to said model of light falloff to determine said amount of light falloff in said digital image.

33. The method in claim 32, wherein said removing comprises:

estimating derivatives of said radial traces;

adjusting said derivatives to produce adjusted derivatives that are within minimum and maximum derivative bounds; and
integrating said adjusted derivatives to produce said adjusted radial traces.

34. The method in claim 29, further comprising preventing underexposed images from being fitted.

35. The method in claim 29, further comprising generating a correction mask for said digital image based on said amount of light falloff.

36. The method as in claim 29, further comprising detecting a flash fire condition of said image based on said amount of light falloff in said digital image.

37. The method in claim 29, wherein said fitting is performed on a group of images and said fitting produces a single amount of light falloff for said group of images.